CHAPTER 6

FUTURE DIRECTIONS IN THE STONES RIVER WATERSHED

6.1 BACKGROUND.

The Watershed Management Plan serves as a comprehensive inventory of resources and stressors in the watershed, a recommendation for control measures, and a guide for planning activities in the next five-year watershed cycle and beyond. Water quality improvement will be a result of implementing both regulatory and nonregulatory programs.

In addition to the NPDES program, some state and federal regulations, such as the TMDL and ARAP programs, address point and nonpoint issues. Construction and MS4 stormwater rules (implemented under the NPDES program) are transitioning from Phase 1 to Phase 2. More information on stormwatrer rules may be found at: http://www.state.tn.us/environment/wpc/stormh2o/MS4.htm.

This Chapter addresses point and nonpoint source approaches to water quality problems in the Stones River Watershed.

6.2. COMMENTS FROM PUBLIC MEETINGS. Watershed meetings are open to the public, and most meetings were represented by citizens who live in the watershed, NPDES permitees, business people, farmers, and local river conservation interests. Locations for meetings were frequently chosen after consulting with people who live and work in the watershed. Everyone with an interest in clean water is encouraged to be a part of the public meeting process. The times and locations of watershed meetings are posted at: http://www.state.tn.us/environment/wpc/public.htm.

6.2.A. Year 1 Public Meeting. The first Stones River Watershed public meeting was held September 17, 1996 at the Fleming Training Center. The goals of the meeting were to 1)present, and review the objectives of, the Watershed Approach, 2)introduce local, state, and federal agency and nongovernment organization partners, 3)review water quality monitoring plans, and 4)solicit input from the public.

Major Concerns/Comments

- Education and voluntary programs are not enough to make a difference
- Siltation due to stream bank erosion
- Tires stacked along river banks
- Loss of biodiversity, especially mussels
- Runoff from landfill
- Pressure from population increase in watershed

6.2.B. Year 3 Public Meeting. The second Stones River public meeting was held April 13, 1998 at the Fleming Training Center. The goals of the meeting were to 1)provide an overview of the watershed approach, 2)review the monitoring strategy, 3)summarize the most recent water quality assessment, 4)discuss the TMDL schedule and citizens' role in commenting on draft TMDLs, and 5)discuss BMPs and other nonpoint source tools available through the Tennessee Department of Agriculture 319 Program and NRCS conservation assistance programs.

Major Concerns/Comments

- Difficulty quantifying NPS contribution
- Loss of public access to river
- Failing septic systems
- Runoff from landfill
- Pressure from population increase in watershed

6.2.C. Year 5 Public Meeting. The third Stones River Watershed public meeting was held August 8, 2002 at the Fleming Training Center (Murfreesboro). The meeting featured seven educational stations:

- Draft Watershed Water Quality Management Plan
- Benthic macroinvertebrate samples and interpretation
- Smart Board with interactive GIS maps
- "Watershed Approach" (self-guided slide show)
- "How We Monitor Streams" (self-guided slide show)
- "Why We Do Biological Sampling" (self-guided slide show)
- Landowner Assistance Programs (NRCS and TDA)

In addition, citizens had the opportunity to make formal comments on the Draft Year 2002 303(d) List.

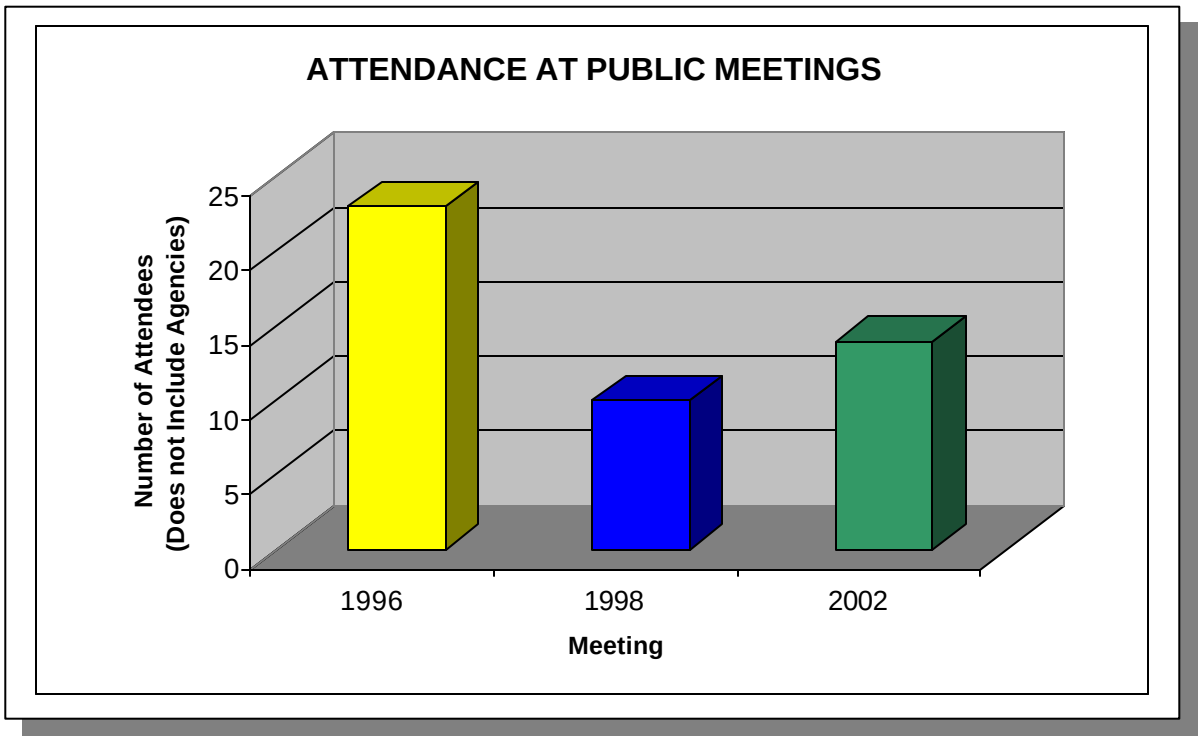

Figure 6-1. Attendance at Public Meetings in the Stones River Watershed. *Attendance numbers do not include agency personnel.*

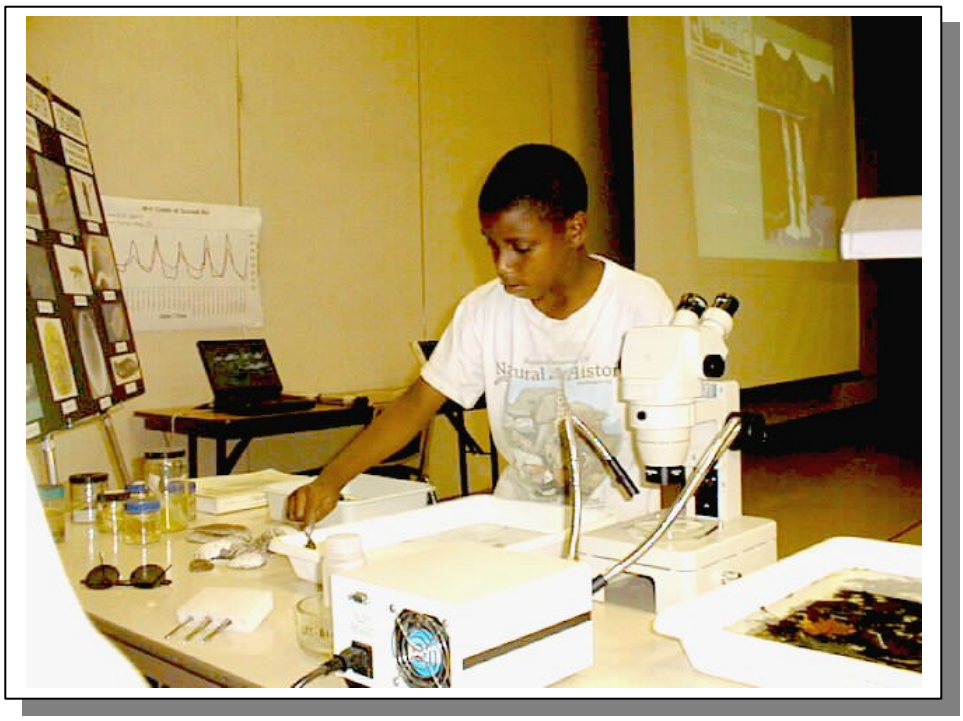

Figure 6-2. The Biology Station at the Stones River Meeting Captured the Imagination of Many Attendees.

6.3. ASSESSMENT OF NEEDS.

6.3.A. Point Sources. Point source contributions to stream impairment are primarily addressed by NPDES and ARAP permit requirements and compliance with the terms of the permits. Notices of NPDES and ARAP draft permits available for public comment can be viewed at http://www.state.tn.us/environment/wpc/wpcppo/index.html. Discharge monitoring data submitted by NPDES-permitted facilities may be viewed at http://www.epa.gov/enviro/html/pcs/pcs_query_java.html.

The purpose of the TMDL program is to identify remaining sources of pollution and allocate pollution control needs in places where water quality goals are still not being achieved. TMDL studies are tools that allow for a better understanding of load reductions necessary for impaired streams to return to compliance with water quality standards. More information about Tennessee's TMDL program may be found at:
http://www.state.tn.us/environment/wpc/tmdl.htm

TMDLs are prioritized for development based on many factors.

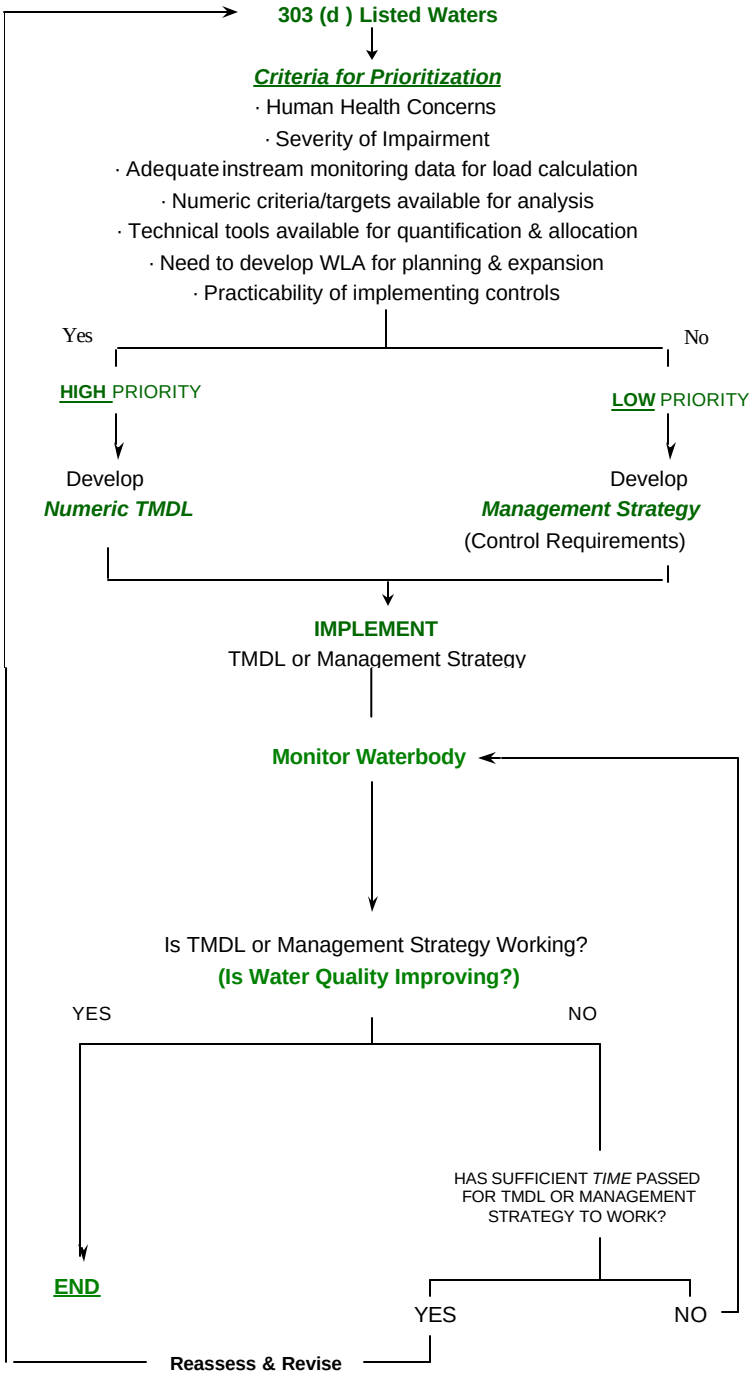

Figure 6.3. Prioritization scheme for TMDL Development.

6.3.B. Nonpoint Sources.

Common nonpoint sources of pollution include urban runoff, riparian vegetation removal, and inappropriate land development, agricultural, and road construction practices. Since nonpoint pollution exists essentially everywhere rain falls and drains to a stream, existing point source regulations can have only a limited effect, so other measures are necessary.

State and federal regulations can address some of the contaminants impacting the Stones River and much attention has been addressed to point sources (discharged through a pipe or ditch). However, since the vast majority of impacts to streams in the Stones River watershed are nonpoint, or diffuse, in nature, controls of point sources are often not sufficient to protect waters.

Some measures include voluntary efforts by landowners and volunteer groups, while others may involve new regulations. Many agencies, including the Tennessee Department of Agriculture and NRCS, offer financial assistance to landowners for corrective actions (like Best Management Practices) that may be sufficient for recovery of impacted streams. Many nonpoint problems will require an active civic involvement at the local level geared towards establishment of improved zoning guidelines, building codes, streamside buffer zones and greenways, and general landowner education.

The following text describes certain types of impairments, causes, suggested improvement measures, and control strategies. The suggested measures and streams are only examples and efforts should not be limited to only those streams and measures mentioned.

6.3.B.i. Sedimentation.

6.3.B.i.a. From Construction Sites. Construction activities have historically been considered "nonpoint sources." In the late 1980's, EPA designated them as being subject to NPDES regulation if more than 5 acres are disturbed. The general permit issued for such construction sites sets out conditions for maintenance of the sites to minimize pollution from stormwater including requirements for inspection of the controls. Also the general permit imposes more stringent inspection and self-monitoring requirements on sites in the watershed of streams that are impaired due to sedimentation.

Construction sites within a sediment-impaired watershed may also have higher priority for inspections by WPC personnel, and are likely to have substantial enforcement actions for failure to control erosion. Some sediment-impaired streams in the Stones River watershed are Olive Branch, Rock Spring Branch and Stewart Creek in the Smyrna area; West Fork Stones River, Lytle Creek, Dry Branch, and Bear Branch in the Murfreesboro area, and in the Fall Creek drainage around S.R. 840.

The same requirements applying to construction sites in sediment-impaired drainages also apply to those within the drainage of high quality waters. Carson Fork and the upper reach of the West Fork Stones River are examples of high quality streams in the Stones River watershed.

The state's construction stormwater permitting measures are currently required for all sites of 5 acres or more, but may also be required on a site-by-site basis for smaller sites where warranted. Regardless of the size, state regulations direct that no construction site be allowed to cause a condition of pollution.

Due to the explosive population growth within the Stones River Watershed during the last decade, sediment erosion and riparian destruction from construction activities have become main sources of stream impairment. The rapid pace and ephemeral nature of these activities have put a substantial strain on the ability of agencies to inspect and monitor these sites adequately. The establishment of local stormwater management agencies within larger urbanized areas in the next couple of years should aid in regulation and controlling runoff from construction activities. Rutherford County, and the cities of Murfreesboro, Smyrna, and LaVergne are currently slated to develop their own MS4 (Municipal Separate Storm Sewer System) programs. Part of the mandate for these MS4 programs will be to draft zoning and building codes designed to address sedimentation. In addition, new federal requirements will reduce the size of the sites subject to NPDES construction stormwater permitting to one acre. Regardless of the size, no construction site is allowed to cause a condition of pollution.

Additional non-regulatory strategies for controlling sediment runoff for residents to consider include the immediate re-vegetation of any bare area, including ditches beside driveways, and the covering of topsoil piles.

6.3.B.i.b. From Channel Alteration and Bank Erosion. Due to past bank and channel alterations and riparian vegetation removal, many streams within the Stones River Watershed have unstable and eroding banks. This erosion can release a surprising amount of sediment downstream. Several agencies are working to stabilize portions of stream banks. These include NRCS, TDOT, and TDA. Much of this work involves voluntary, cost-sharing projects with landowners. Some methods or controls that might be necessary to address common problems are:

Voluntary activities

- Re-establishment of bank vegetation. This is perhaps the most effective means of reducing not only bank erosion and sedimention, but also a variety of other impacts, including organic enrichment and aggravated flooding. Many impacted streams would benefit from the reestablishment of riparian vegetation, including Wades Branch, McKnight Branch, and the East Fork Stones River.
- Establish off-channel watering areas for cattle. Cattle activity can create very destabilized and denuded banks. Several current BMP methods exist for moving watering troughs and feeders back from stream banks, including solar powered pumps, or pond construction. An example of a stream that could benefit would be Cedar Creek. Where it is not possible to exclude cattle from a creek, effort should be made to limit cattle access to streams to a single point, using fencing or other methods.

Additional strategies

- Increased efforts in the Master Logger program to recognize impaired streams and require more effective erosion management and road-building practices in silviculture activities.
- Additional restrictions on logging in streamside management zones.

- Better community planning of development impacts on small streams, especially development in rapidly growing areas.
- Local restrictions requiring postconstruction runoff rates to be no greater than preconstruction rates in order to avoid in-channel erosion and downstream flooding.
- Restrictions on impervious surface densities in urbanized areas. Impervious surfaces (parking lots, roads, rooftops) increase runoff rates to streams, causing destabilization and erosion as well as increased pollutant transport.
- Better landowner education on the proper, low-impact methods for clearing of stream and ditch banks. *Note: Permits are currently required for any work along streams if water quality is altered.*
- Additional restrictions on multiple road and utility line crossings of streams. This should include the proper sizing and installation of culverts.
- Restrictions on the use of off-highway vehicles on stream banks and in stream channels.

6.3.B.ii. Pathogen Contamination.

Possible sources of pathogens are inadequate or failing septic tank systems, overflows or breaks in public sewer collection systems, poorly disinfected discharges from sewage treatment plants, and fecal matter in streams and storm drains due to pets, livestock and wildlife. Permits issued by the Division of Water Pollution Control regulate discharges from point sources, and these permits require adequate control for these sources. Individual homes are required to have subsurface, on-site treatment (i.e., septic tank and field lines) if public sewers are not available. Septic tank and field lines are regulated by TDEC's Division of Ground Water Protection and delegated county health departments. In addition to discharges to surface waters, businesses may employ either subsurface or surface disposal of wastewater. The Division of Water Pollution Control regulates surface disposal.

Other measures that may be necessary to control pathogens are:

Voluntary activities

- Off-channel watering of livestock or limiting livestock access to streams (see above).
- Proper management of animal waste from feeding operations.

Enforcement strategies

- Greater enforcement of regulations governing on-site wastewater treatment.
- Timely and appropriate enforcement for non-complying sewage treatment plants, large and small, and their collection systems.
- Identification of Concentrated Animal Feeding Operations not currently permitted, and enforcement of current regulations.

Additional strategies

- Restrict development in areas where sewer is not available to only those sites with appropriate soils.
- Develop and enforce leash laws and controls on pet fecal material in highly populated areas.

- Greater efforts by sewer utilities to identify leaking lines or overflowing manholes, and more frequent upgrades to reduce infiltration and inflow (examples: McCrory and Stoners Creek in Davidson County.)

6.3.B.iii. Excessive Nutrients and/or Dissolved Oxygen Depletion.

These two impacts are usually listed together because high nutrients often contribute to low dissolved oxygen within a stream. Since nutrients often have the same source as pathogens, the measures previously listed can also address many of these problems. Elevated nutrient loadings are also often associated with urban runoff from impervious surfaces and from fertilized lawns and croplands.

Other sources of nutrients can be addressed by:

Voluntary activities

- Encourage no-till farming, and the proper rate of fertilizer for the soil and crop.
- Educate homeowners and lawn care companies in the proper application of fertilizers.
- Encourage landowners, developers, and builders to leave stream buffer zones. Streamside vegetation can filter out many nutrients and other pollutants before they reach the stream. These riparian buffers are also vital along livestock pastures. Additional examples of streams that could benefit from buffers are Jarman Branch and streams in the Bradley Creek drainage.
- Use grassed drainageways that can remove fertilizer before it enters streams.
- Use native plants for landscaping since they don't require as much fertilizer and water.

Physical changes to streams can prevent them from providing enough oxygen to biodegrade the materials that are naturally present. A few additional actions can address this problem:

- Maintain shade over a stream. Cooler water can hold more oxygen and retard the growth of algae. Many streams in the Stones River watershed suffer from canopy removal.
- Discourage impoundments. Deepwater environments such as ponds and lakes do not aerate water, and often become eutrophic through nutrient buildup, encouraging algae growth. *Note: Permits are required for any work on a stream, including impoundments.*

6.3.B.iv. Toxins and Other Materials.

Many materials enter our streams due to apathy, or lack of civility or knowledge by the public. Litter in roadside ditches, garbage bags tossed over bridge railings, paint brushes washed off over storm drains, and oil drained into ditches are all blatant examples of pollution in streams. Some can be addressed by:

Voluntary activities

- Providing public education.
- Painting warnings on storm drains indicating a connection with a stream. (This would benefit urban streams like Stewart, Lytle, and West Fork Stones).
- Sponsoring community clean-up days.
- Landscaping of public areas and greenway development.
- Encouraging public surveillance of their streams and reporting of dumping activities to their local authorities.
- Public education concerning dumping into sinkholes, and their connection with groundwater contamination

Needing regulation

- Prohibition of illicit discharges to storm drains. (Local MS4 programs will help address this.)
- Litter laws and strong enforcement at the local level.

6.3.B.v. Habitat Alteration.

The alteration of the habitat within a stream can have severe consequences. Whether it is the removal of the vegetation providing a root system network for holding soil particles together, the release of sediment, which increases the bed load and covers benthic life and fish eggs, the removal of gravel bars, "cleaning out" creeks with heavy equipment, or the impounding of the water in ponds and lakes, many alterations impair the use of the stream for designated uses. Habitat alteration also includes the draining or filling of wetlands. Measures that can help address this problem include:

Voluntary activities

- Organizing stream cleanups removing trash, limbs and debris by hand or winch before they cause blockage.
- Avoiding use of heavy equipment to "clean out" streams.
- Planting vegetation along streams to stabilize banks and provide habitat.
- Encouraging developers to avoid extensive culverting or relocation of streams.

Current regulations

- Reduce or restrict modification of streams by such means as culverting, lining, or impounding. (McCrory Creek would benefit.)
- Require mitigation for impacts to streams and wetlands when modifications are allowed.

Additional Enforcement or Restrictions

- Increased enforcement may be needed when violations of current regulations occur.
- More restrictive alteration regulations to discourage extensive relocations, impoundment of headwater streams, culverting, ripraping of banks, and removal of riparian vegetation.